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Crystal size and shape distributions plagioclase and determining of crystal residence time in the Chah-Musa intrusion (South Shahrood)

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Abstract: Considering the importance of plagioclase in reconstructing magma cooling processes, the size and shape distribution of this mineral is investigated for Chah - Musa sub-volcanic intrusion (NW Toroud- Semnan Province). The slopes of CSD diagrams, the natural logarithm of the density of the crystalline density (n) against the length of the crystal (L), show plagioclase phenocrysts available in this intrusion have been grown with rates of 1.4×10^{-8} to 9.27×10^{-9} mms^{-1}, in time limited 118.62 to 630.7 years. The calculated residence time of magma in Chah-Musa intrusion coincides with sub-volcanic nature of the studied samples. Crystal size distribution diagrams suggest presence of two populations of crystals that formed during the anneal period as well as during decompression, associated with separate nucleation regimes.

Keywords: *Crystal size distribution (CSD); plagioclase; Chah – Musa.*

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